

## ABSTRAK

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Latar Belakang : Riskesdas 2018 melaporkan prevalensi obesitas pada dewasa di Indonesia meningkat dari 14,8% di tahun 2013 menjadi 21,8% di tahun 2018. Prevalensi obesitas pada perempuan (29,3%) lebih tinggi dibandingkan laki-laki (14,5%). Efek suplementasi *zinc* pada anak obesitas menurunkan kadar GDS dan kolesterol darah. Suplementasi probiotik pada wanita menopause obesitas menurunkan IMT, lingkaran pinggang dan tekanan darah. Belum ada penelitian yang mengungkapkan pengaruh kombinasi *zinc* + LCS + CR terhadap profil lipid dan indikator antropometri pada wanita obesitas di Indonesia.

Tujuan : Menganalisis pengaruh suplementasi *zinc*, *Lactobacillus casei Strain Shirota (LCS)* dan gabungan keduanya yang ketiganya dikombinasikan dengan pembatasan kalori /*calorie restriction (CR)* terhadap profil lipid yang terdiri dari kolesterol total, *Cholesterol High-density Lipoprotein (HDL-C)*, *Cholesterol Low-density Lipoprotein (LDL-C)* dan trigliserida serta indikator antropometri (lingkaran pinggang dan persen lemak tubuh) pada wanita obesitas.

Metode : Penelitian ini merupakan *randomized control trial design* pada 84 orang wanita obesitas yang dibagi menjadi empat kelompok perlakuan yaitu kelompok I sebagai kelompok kontrol, Kelompok II diberi suplemen *zinc sulfate monohydrate* 30 mg/hari, kelompok III diberi suplemen *LCS*  $6,5 \times 10^9$  CFU/hari dan Kelompok IV diberi keduanya. Ketiga kelompok suplementasi dikombinasikan dengan pembatasan kalori sebesar 500 kkal. Pengukuran antropometri, dan profil lipid darah (kolesterol total, trigliserida, LDL-C dan HDL-C) dilakukan sebelum dan setelah intervensi selama 30 hari. Semua kelompok diberi edukasi tentang pola makan pada obesitas dan daftar penukar bahan makanan.

Hasil : Pada kelompok kontrol menunjukkan tidak ada perbedaan antara kadar profil lipid sebelum dan setelah intervensi tetapi terdapat penurunan lingkaran pinggang dan persen lemak tubuh setelah 30 hari. Pada kelompok *zinc* + CR, LCS + CR dan *zinc* + LCS + CR terdapat perbaikan profil lipid, lingkaran pinggang dan persen lemak tubuh setelah intervensi. Antar kelompok perlakuan menunjukkan terdapat perbedaan yang signifikan pada profil lipid, lingkaran pinggang serta persen lemak tubuh sebelum dan setelah intervensi. Ada hubungan antara persentase asupan lemak dengan kenaikan kadar HDL-C pada kelompok intervensi. Setelah dikontrol asupan makanan, pada kelompok yang mendapatkan suplementasi *zinc*+CR, penurunan kadar kolesterol, trigliserida, lingkaran pinggang dan persen lemak tubuh lebih besar dibandingkan dengan kelompok lainnya, tetapi kenaikan kadar HDL-C dan penurunan kadar LDL-C lebih besar pada kelompok *zinc*+LCS +CR.

Kesimpulan : Terdapat pengaruh suplementasi *zinc*+CR, LCS+CR dan *zinc*+ LCS+CR terhadap penurunan profil lipid (kolesterol total, trigliserida, LDL-C), lingkaran pinggang dan persentase lemak tubuh serta kenaikan kadar HDL-C pada wanita obesitas.

## ABSTRACT

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**Background:** The 2018 Riskesdas reported that the prevalence of adult obesity in Indonesia increased from 14.8% in 2013 to 21.8% in 2018. The prevalence of obesity in females (29.3%) was higher than males (14.5%). The effect of zinc supplementation in obese children reduces GDS and blood cholesterol levels. Probiotic supplementation in obese menopausal women reduces BMI, waist circumference and blood pressure. There are no studies that reveal the effect of zinc + LCS + CR combination on lipid profile and anthropometric indicators in obese women in Indonesia.

**Objectives:** Analyze the effect of zinc supplementation, *Lactobacillus casei* Strain Shirota (LCS) and both combination with calorie restriction (CR) on lipid profile consisting of total cholesterol, high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C) and triglycerides as well as anthropometric indicators (waist circumference and percent body fat) in obese women.

**Methods:** This study was a randomized control trial design on 84 obese women who were divided into four treatment groups: Group I as control group, Group II was supplemented with zinc sulfate monohydrate 30 mg/day, Group III was supplemented with LCS supplement  $6.5 \times 10^9$  CFU/day and Group IV was given both. The three supplementation groups were combined with calorie restriction of 500 kcal. Anthropometric measurements, and blood lipid profiles (total cholesterol, triglycerides, LDL-C and HDL-C) were performed before and after the intervention for 30 days. All groups were provided with education on diet in obesity and a food exchange list.

**Results:** The control group showed no difference between lipid profile levels before and after the intervention but there was a decrease in waist circumference and percent body fat after 30 days. In the zinc + CR, LCS + CR and zinc + LCS + CR groups, there were improvements in lipid profile, waist circumference and percent body fat after the intervention. Between treatment groups, there were significant differences in lipid profile, waist circumference and percent body fat before and after the intervention. There was an association between the percentage of fat intake and the increase in HDL-C levels in the intervention group. After controlling for food intake, the zinc+CR supplementation group had greater reductions in cholesterol, triglycerides, waist circumference and percent body fat than the other groups, but the increase in HDL-C and decrease in LDL-C were greater in the zinc+LCS+CR group.

**Conclusion:** There is an effect of zinc+CR, LCS+CR and zinc+ LCS+CR supplementation on reducing lipid profiles (total cholesterol, triglycerides, LDL-C), waist circumference and body fat percentage and increasing HDL-C levels in obese women.